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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,432	12/28/2001	Myoung Goo Lee	0630-1290P	4397

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EXAMINER

LANDAU, MATTHEW C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,432

Applicant(s)

LEE ET AL.

Examiner

Matthew Landau

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-- Th MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-9,11,14-18 and 21-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28-30 is/are allowed.
- 6) ☒ Claim(s) 1,5,7-9,11,14-18,21-23,25-27 and 31 is/are rejected.
- 7) ☒ Claim(s) 6 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 11, 18, 27 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (US Pat. 6,323,523, hereinafter Lee).

In regards to claim 1, Figure 3A of Lee discloses a multi-finger type ESD protection device comprising: a semiconductor substrate; a plurality of first active regions (201B/202A/201A and 101A/102A/101B) formed separately on the semiconductor substrate; a plurality of gates (200 and 105) formed in each of the first active regions; and at least one predetermined conductive type second active region 124 formed between two of the first active regions, wherein the predetermined conductive type second active region includes an n⁺ junction connected to Vcc reference voltage, and is without a gate, a source and a drain; and a third active region (110A/110C) surrounding the first and second active regions and being of conductivity type different from that of the first active regions.

In regards to claim 11, Figure 3A of Lee discloses a multi-finger type ESD protection device comprising: a semiconductor substrate; a plurality of first active regions (201B/202A/201A and 101A/102A/101B) formed separately on the semiconductor substrate; a plurality of gates (200 and 105) formed in each of the first active regions; and at least one predetermined conductive type second active region 124 formed between two of the first active

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regions, wherein the predetermined conductive type second active region includes an n+ junction connected to Vcc reference voltage, and is without a gate, a source and a drain.

In regards to claim 18, Figure 3A of Lee discloses a multi-finger type ESD protection device comprising: a semiconductor substrate; a plurality of first active regions (201B/202A/201A and 101A/102A/101B) formed separately on the semiconductor substrate; a plurality of gates (200 and 105) formed in each of the first active regions; and at least one predetermined conductive type second active region 110B formed between two of the first active regions, wherein the predetermined conductive type second active region includes an p+ junction connected to ground Vss, and is without a gate, a source and a drain; and a third active region (110A/110C) surrounding the first and second active regions and being of conductivity type different from that of the first active regions.

In regards to claim 27, Figure 3A of Lee discloses spaces are provided between the first and second active regions.

In regards to claim 31, Figure 3A of Lee discloses a multi-finger type ESD protection device comprising: a semiconductor substrate; a plurality of first active regions (201B/202A/201A and 101A/102A/101B) formed separately on the semiconductor substrate; a plurality of gates (200 and 105) formed in each of the first active regions; and at least one predetermined conductive type second active region 110B formed between two of the first active regions, wherein the predetermined conductive type second active region includes an p+ junction connected to ground Vss; and a third active region (110A/110C) surrounding the first and second active regions and being of conductivity type different from that of the first active regions, wherein spaces are provided between the first and second active regions.

Claims 11, 14, 15, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim.

In regards to claim 11 and 14, Figures 2 and 3 of Kim disclose a multi-finger type ESD protection device comprising: a semiconductor substrate; a plurality of first active regions (36'/34/36 and 56'/54/56) formed separately on the semiconductor substrate; a plurality of gates (38 and 58) formed in each of the first active regions; and at least one predetermined conductive type second active region 64 formed between two of the first active regions, wherein the predetermined conductive type second active region includes an n+ junction connected to Vcc reference voltage, and is without a gate, a source and a drain.

In regards to claim 15, Figure 2 of Kim discloses source regions each formed between two gates in each of the first active regions.

In regards to claim 16, Figure 2 of Kim discloses the first and second active regions and the gates extend substantially parallel to each other and have a substantially same shape.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5, 7-9, 18, 21-23, 25-27, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukude in view of Ito and Lin.

In regards to claims 1, 18, 23, 27, and 31, Figure 8 of Tsukude discloses a multi-finger type ESD protection device comprising: a semiconductor substrate; a plurality of first active regions (2a/2b/2c) formed separately on the semiconductor substrate; a plurality of gates (3a/3b) formed in each of the first active regions; and at least one predetermined conductive type second active region 16e formed between two of the first active regions, wherein the predetermined conductive type second active region is without a gate, a source and a drain; and wherein spaces are provided between the first and second active regions. A difference between Tsukude and the claimed invention is the second active region includes a p⁺ junction connected to ground V_{ss}. Tsukude discloses a p-type substrate with n-type active regions, wherein the second active region includes an n⁺ junction connected to ground V_{ss} (column 9, lines 63-67). Figure 2 of Ito discloses P-type MOS transistor with an n-type substrate and p-type active regions. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Tsukude by reversing the conductivity types of the substrate and active regions, thereby obtaining a second active region with a p⁺ junction connected to ground V_{ss}. The ordinary artisan would have been motivated to modify Tsukude in the manner described above since n-type and p-type devices are art-recognized equivalents. A further difference between Tsukude and the claimed invention is a third active region surrounding the first and second active regions and being of conductivity type different from that of the first active regions. Figure 1 of Lin discloses a p⁺ guard ring (third active region) surrounding a multi-fingered MOSFET, wherein the guard ring has a conductivity type different than that of an active region which it surrounds (column 5, lines 10-15). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the

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invention of Tsukude by including the guard ring (third active region) of Lin for the purpose of preventing latchup.

In regards to claim 5, Figure 8 of Tsukude discloses a plurality of drain regions (2a/2c) formed in each of the first active regions.

In regards to claims 7 and 25, Figure 8 of Tsukude discloses a plurality of source regions 2b each formed between a pair of gates in each of the first active regions.

In regards to claims 8, 9, and 26, Figure 8 of Tsukude discloses the first and second active regions and the gates extend substantially parallel to each other and have a substantially same shape.

In regards to claims 21 and 22, it is further obvious in the invention of Tsukude in view of Ito and Lin to use the guard ring (third active region) of Lin, which completely surrounds the first and second active regions (see Figure 1), for the purpose of improving protection against latchup.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee in view of Lin.

In regards to claim 17, Figure 3A of Lee discloses a third active region (110A/110C) surround the first and second active regions. The difference between Lee and the claimed invention is the third active region surrounding completely the first and second active regions. Figure 1 of Lin discloses a guard ring (third active region) completely surrounding another active region. In view of such teaching, it would have been obvious to the ordinary artisan at the time

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the invention was made to modify the invention of Lee by using the guard ring of Lin for the purpose of improving protection against latchup.

Allowable Subject Matter

Claims 28-30 are allowed.

Claims 6 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: the prior art of record, either singularly or in combination, does not teach or suggest at least the limitation of the second active region including an n+ junction connected to Vcc reference voltage or a p+ junction connected to ground Vss and drain regions formed at n+ junctions of both end portions of each of the first active regions.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments with respect to the pending claim have been considered but are moot in view of the new ground(s) of rejection.


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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (703) 305-4396.

The examiner can normally be reached from 8:00 AM-4:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Matthew C. Landau

Examiner

July 9, 2003